Commonwealth of Kentucky
Division for Air Quality

PERMIT STATEMENT OF BASIS

Administrative Amendment to Minor Revision
Conditional Major, Operating
Permit: F-05-011R1
MARKWEST ENERGY APPALACIA, LLC
South Shore, KY 41175
September 5, 2007
Sukhendu K. Majumdar, Reviewer

SOURCE ID:	21-089-00005
AGENCY INTEREST:	1600
ACTIVITY:	APE20070002

In the Minor Permit (F-05-011R1) Revision dated August 13, 2007, the source name and the county location of the facility were inaccurate and were corrected in the administrative amendment.

SOURCE DESCRIPTION:

MarkWest Energy Appalachia, LLC owns and operates an onshore natural gas processing plant located at South Shore, Kentucky referred to as the Siloam facility. This facility receives natural gas liquids from pipeline and from trucks and then physically separates the natural gas liquids into its pure components, such as propane, butane and other products.

MarkWest Energy Appalachia, LLC at Siloam facility has applied for a minor modification to the present operating permit F-05-011 to the Division on July 2, 2007. The modification application includes the addition of two (2) diesel powered fire water pumps, addition of truck unloading facility to unload Natural Gas Liquid (NGL) at a low pressure and a correction to the permit language regarding venting of propane during loading of trucks and railcars.

The Siloam facility is classified as an onshore natural gas processing plant that uses fractionation to produce a variety of products from natural gas liquids (NGL). The equipment at this facility, which also has the potential to generate emissions of regulated air contaminants, is capable of producing propane, normal butane, isobutane, high-purity butanes and natural gasoline. Operations at the facility include NGL fractionation equipment, above/under ground storage and process tanks, truck loading/unloading operations, railcar loading operations and river barge loading operations. The facility is also equipped with two small industrial boilers (each less than 250 mmBtu/hr).

COMMENTS:

Two diesel-powered engine for fire water pumps, that the facility is proposing to install, have the capacity of 170 hp and the maximum hours of operation would be one hour per month or 12 hours per year. The pumps were manufactured in 1969 by Detroit Pumps Company. The emissions from the engine exhaust would be insignificant source because the potential to emit (PTE) would not exceed one (1) ton per year of combined Hazardous Air Pollutant (HAP) or five (5) tons per year of any non-hazardous regulated air pollutant.

MarkWest Energy Appalachia is proposing to add the inbound truck unloading operation to unload

Natural Gas Liquid (NGL) at a low pressure. The trucks will be connected to a pipeline that will feed to NGL storage tank. A propane blanket at 120 psi would be used to push the NGL from tank truck to storage tank. Maximum gallons NGL unloading from the truck would be 120,000 in a day. Volatile Organic Chemical (VOC) emissions from the unloading process would only be during connection and disconnection of the unloading hoses to the trucks. The process would be insignificant activity because emissions from the unloading hoses would be below the significant emission threshold.

Propane is loaded onto railcars and tank trucks at the Siloam Facility and it was assumed in the operating permit (F-05-011) that the emissions during the loading of propane would go to flare (EP-05). But the propane loading does not require venting of vapors. The railcars and tank trucks are loaded through their internal spray bars. The spray bars are tubes located at the top of the railcars and tank trucks that have series of holes in them so that the propane enters the vapor space as a mist, which condenses the vapors back to liquid. This reduces the volume of vapors in the free space allowing the containers to be loaded without need to vent.

Emission Points and Description:

Emission Point (EP-01): # 1 Boiler Stack with natural gas as a fuel only.
Heat Capacity: 43.6 million British thermal unit per hour (mmBtu/hr)
Emission Point (EP-02): # 2 Boiler Stack with natural gas and option to burn propane as fuel.
Heat Capacity: 43.6 million British thermal unit per hour (mmBtu/hr)
Emission Point (EP-04): Fugitive emissions from Natural Gas Liquid (NGL) separation processing.
Number of Light liquid/ gas Valves: 2399
Number of Light liquid/gas Pump Seals: 38
Number of Light liquid/gas Compressor Seals: 2
Number of Light liquid/gas Pressure Relief Valves (PRV): 75
Number of Light liquid/gas Connectors: 6494
Emission Point (EP-05): Flare with natural gas fired pilot flame.
Emission Point (EP-06): Barge Loading- Natural Gasoline, Normal Butane and Iso-butane.
Maximum Capacity: 35,973,000 gallons each product.
Emission Point (EP-07): Railcar Loading- Natural Gasoline, Normal Butane and Iso-butane and propane
Control Device: Flare
Maximum Capacity: 60,283,000 gallons each product.
Emission Point (EP-08): Tank Truck Loading- Natural Gasoline, Normal Butane and Iso-butane and propane
Control Device: Flare
Maximum Propane Loading: 110,189,078 gallons
Emission Point (EP-09): Storage Vessels Vents
Control Device: Flare
Emission Point (EP-10): Gasoline Storage Tank Vents
Capacity: 840,000 gallons
Control Device: Flare

Emission factors and their source: AP-42, material balance, performance test

Applicable regulation:

401 KAR 52:030 - *Federally enforceable permits for non-major sources.* This applies to sources that accept permit conditions that are legally and practically enforceable to limit their potential to emit (PTE) below the major source thresholds that would make them subject to 401 KAR 52:020.

401 KAR 60:005 incorporating by reference 40 CFR 60, Subpart KKK, *Standards of Performance for Equipment Leaks of VOC from Onshore Natural Gas Processing Plants.* The requirements of this rule apply to EP04, Fugitive Emissions, since modifications have been made since January 20, 1984 to affected equipment, i.e., compressors in VOC service or in wet gas service and process units, as defined. The permittee shall continue to comply with the applicable requirements of 40 CFR 60, Subpart VV, *Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry, as specifically identified in 40 CFR 60, Subpart KKK.*

401 KAR 60:005, incorporating by reference 40 CFR 60, Subpart Kb, *Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced after July 23, 1984.* The rule is applicable to storage tanks SV-502, SV-503, SV-504, SV-505, SV-506 and YD-29, as each vessel was constructed or modified after July 23, 1984. Vessels SV-503, SV-504, SV-505 and SV-506 vent to and are vapor balanced with SV-502. Vessel SV-502 is controlled by a vapor recovery system that is connected to a flare. Vessel YD-29 is also connected to, and controlled by, the flare.

401 KAR 61:015 – *Existing indirect heat exchangers*, which applies to emission units with a capacity of 250 mmBtu/hr heat input or less constructed before April 1972. This rule applies to both Boiler Nos. 1 and 2, as each unit was constructed in 1958 and 1960, respectively, (prior to April 1972).

401 KAR 63:015, *Flares. This rule is applicable to the existing flare that is connected to the vapor recovery system for emissions control pursuant to 40 CFR 60, Subpart Kb.*

40 CFR 60.18, *General Control Device Requirements. These requirements apply to the flare as specified in 40 CFR 60 Subpart Kb.*

EP#01 and #02 PM Limitation:

Pursuant to 401 KAR 61:005 Appendix A the standard for particulate matter is calculated by the following equation:

Boiler#1 (Installed in 1958), and Boiler #2 (Installed 1960)*

$$0.9634\,(\textit{total heat input capacity})^{-0.2356} = 0.9634(87.2)^{-0.2356} = 0.3362\ lb/mmBtu$$

* The allowable emission rate is determined in accordance with 401 KAR 61:015, Section 3(1) based on the **total** rated heat input capacity of the two existing boilers, (i.e., 43.6×2 = 87.2 mmBtu/hr).

EP#01 and #02 SO_2 Limitation:

Pursuant to 401 KAR 61:015 Appendix B the standard for sulfur dioxide is calculated by the following equation:

Boiler#1 (Installed in 1958), and Boiler#2 (Installed in 1960)

$$8.0189\ (total\ heat\ input\ capacity)^{-0.1260} = 8.0189\ (87.2)^{-0.1260} = 4.5668\ lb/mmBtu$$

Non-Applicable Regulations

40 KAR 59:050. *New storage vessels for petroleum liquids.* This rule does not apply because the facility is not in a non-attainment county.

40 KAR 61:050. *Existing storage vessels for petroleum liquids.* This rule does not apply because the facility is not in a non-attainment county.

401 KAR 61:095. *Existing solvent metal cleaning equipment.* The provisions of this subpart do not apply to the 30-gallon solvent parts cleaner, as an insignificant activity, since this unit was installed in 1993, which is after the classification date of June 29, 1979.

401 KAR 59:185, *New solvent metal cleaning equipment.* The provisions of this subpart do not apply to the 30-gallon solvent parts cleaner, as an insignificant activity, since the facility is not located in a county or portion of a county designated as non-attainment for ozone.

40 CFR 60 Subpart LLL, *Standard of Performance for Onshore Natural Gas Processing: SO_2 emissions.* This regulation does not apply since MarkWest Energy Appalachia, LLC does not operate natural gas sweetening units.

40 CFR 63 Subpart Q, *National Emission Standards for Hazardous Air Pollutants for Industrial Process Cooling Towers.* The provisions of this subpart do not apply to the cooling towers, as an insignificant activity, since this unit does not use chromium-based water treatment chemicals, nor is this a major source of HAP emissions, as defined at 40 CFR 63.2.

40 CFR 63 Subpart T, *National Emission Standards for Halogenated Solvent Cleaning.* The provisions of this subpart do not apply to the 30-gallon solvent parts cleaner, as an insignificant activity, since this unit does not use regulated halogenated HAP solvents in a total concentration greater than 5 percent by weight as a cleaning or drying agent.

40 CFR 64, Compliance Assurance Monitoring (CAM), does not apply to any emission unit because this source is being approved to operate under a Conditional Major permit and, pursuant to
40 CFR 64.2(a), the requirements of this rule are applicable only to a source required to obtain a Title V (Part 70 or 71) permit.

40 CFR 60, Subpart K, *Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After June 11, 1973, and Prior to May 19, 1978,* does not apply to any of the tanks in Section C of the permit since none of the tanks with a capacity greater than 40,000 was installed between June 11, 1973 and May 19, 1978.

40 CFR 60, Subpart Ka, *Standards of Performance for Storage Vessels for Petroleum Liquids for Which Construction, Reconstruction, or Modification Commenced After May 18, 1978, and Prior to July23, 1984,* does not apply to any of the tanks in Section C of the permit since all tanks with a capacity greater than 40,000 gallons that were installed between June 11, 1973 and May 19, 1978

are designed to operate in excess of 204.9 kPa (15 psi) with no emissions to the ambient air. Such tanks are not *storage vessels* pursuant to 40 CFR 60.111a(a)(1).

40 CFR 60, Subpart Kb, *Standards of Performance for Volatile Organic Liquid Storage Vessels(including Petroleum liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July23,* 1984 does not apply to any of the tanks in Section C of the permit since these tanks are pressurized and operate in excess of 204.9 kPa without emissions to the atmosphere.

40 CFR 60, Subpart IIII, *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines does not apply as these pumps were manufactured in 1969.*

EMISSION AND OPERATING CAPS DESCRIPTION:

VOC and HAP Conditional Major Limitation:
MarkWest Energy Appalachia, LLC has requested voluntary permit emission limits of 9 tons per year (tpy) or less of a single Hazardous Air Pollutant (HAP), 22.5 tpy of less of combined HAPs, and 90 tpy or less of Volatile Organic Compounds (VOC). Compliance with the permit limits shall make the requirements of 401 KAR 52:020, Title V permits, not applicable to this source. Compliance with the VOC limit shall also make this source a synthetic minor source pursuant to 401 KAR 51:017, Prevention of Significant Deterioration (PSD) of air quality.

PERIODIC MONITORING:

EP#01 and #02 – Boilers #1 and 2:
The permittee shall monitor and maintain records of the following information:

a. The monthly natural gas/propane usage rate (cubic feet or gallons per month).
b. The monthly hours of operation of each boiler.
c. The sulfur content of natural gas/propane burned. The sulfur content may be determined by fuel sampling and analysis or by fuel supplier certification.
d. During periods of boiler startup, shutdown or malfunction, log of the following information shall be kept:
    1) Whether any air emissions were visible from the boiler stack.
    2) Whether the visible emissions were normal for the process.
    3) The color of the emissions and whether the emissions were light or heavy.
    4) The cause of the abnormal visible emissions
    5) Any corrective actions taken.

EP#04 – Fugitive Emissions:
Monitoring shall be done in accordance with procedures given in 40 CFR 60 Subpart KKK, Section 60.632, *Standards,* and 40 CFR 60 Subpart VV, Section 60.482-1 through 10, *Standards,* and/or Section 60.483-1 and 2, *Alternative Standards.*

EP#05 – Flare:
Monitoring shall be done in accordance with 40 CFR 60.18, *General Control Device Requirements.* These requirements are incorporated into the permit **Section B** for EP 05 (Flare).

EP#09, and #10 – Vessels SV-502 and YD-29:

a. The permittee shall maintain records of the VOL stored, the period of storage, and the maximum true vapor pressure of that VOL during the respective storage period.

b. The permittee shall notify the Administrator within 30 days when the maximum true vapor pressure of the liquid exceeds the respective maximum true vapor pressure values for each volume range.

c. Pursuant to 40 CFR 60.116b (b), for each tank listed above, the permittee shall keep readily accessible records showing the dimensions of the tank and an analysis showing the capacity of the tank. The records shall be kept for the life of the tank.

OPERATIONAL FLEXIBILITY:
None

CREDIBLE EVIDENCE:

This permit contains provisions that require specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has only adopted the provisions of 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12 into its air quality regulations.